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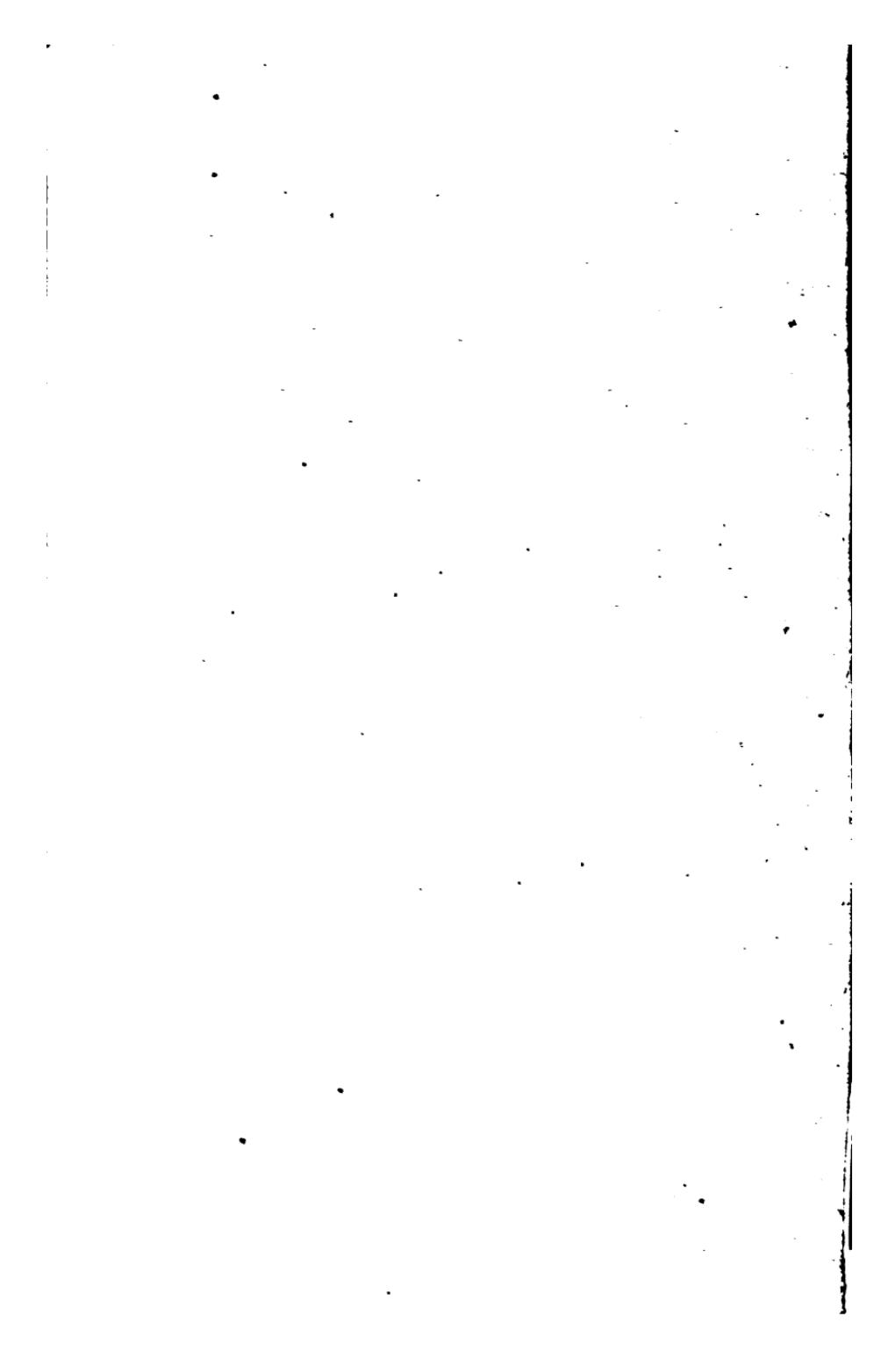
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*From Geo. Angell* —

SOME

## SPECULATIONS AND QUERIES

IN

# REGARD TO EARTHQUAKES.

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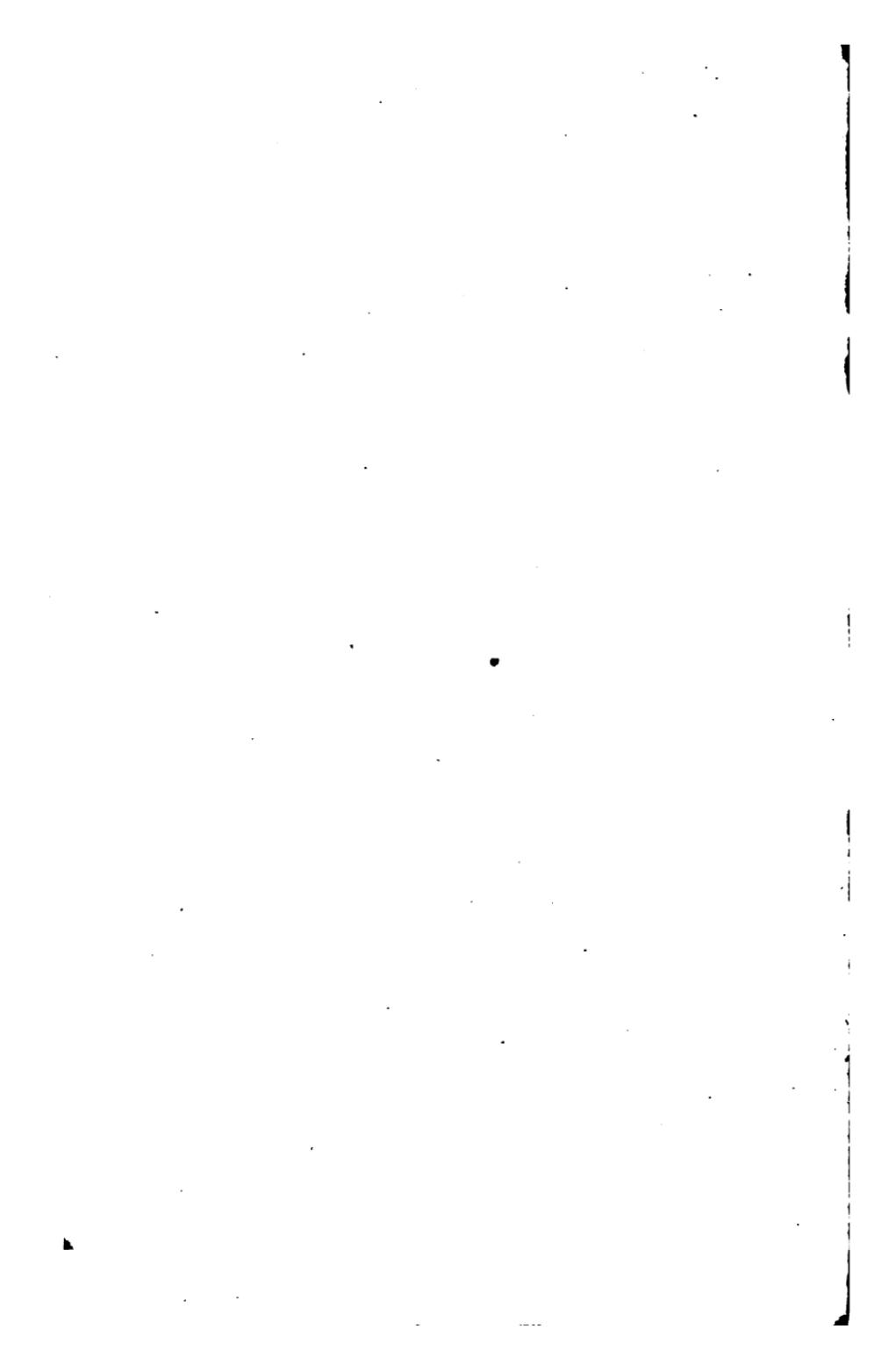
ARE THEY CAUSED BY THE SAME POWER  
AS THAT WHICH PRODUCES THE  
TIDES IN THE OCEAN ?

*By W. P. MORE.*

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KINGSTON, N. Y.

1897.



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KINGSTON, N. Y.:  
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## INTRODUCTION.

I do not expect that the statements which I shall make in this article will be believed by many, and, perhaps, they will be by none, since they conflict in some respects with the prevailing belief. And, as I am only an amateur, untitled and unknown, people will certainly have less faith in the propositions I shall put forth, it matters not how true they may be, than they have in the theories—be they ever so false—of some renowned scientist of the present or former times. It assuredly requires at least some fame or notoriety—of which I have none—to advertise and give favor to opinions; and, as I am lacking in purse as well as fame, I find myself under the necessity of making this work short, and cannot, within its limits, enter into all of the minute details required to demonstrate in every case the truth of my views. And, as I shall have to base my remarks on the mere statements alone of the prominent physical facts which apply to the subject, its brevity only is relied on to make it attractive, so that a few of the many persons among whom I shall distribute this work, who would neglect a lengthy article—even if it were written by some famous character—may read this short article, out of mere curiosity to know what this amateur scientist has to say.

It is well to keep in mind this fact, which all history teaches, that the best of people are liable to hold erroneous views. And it is certainly not impossible that some of the prominent theories which are advocated by scientists of the present age—theories which have been handed down from titled and exalted persons—may still be erroneous.

The diverse opinions, held by the people of different countries everywhere, are largely those which have been

handed down from generation to generation; and, as a rule, these opinions are accepted as being the truth, not by a close examination, but largely by a species of faith. It is this fact that lies at the root of all the false as well as the true doctrines and ideas which are held by the people of different countries the world over. It is really but a small percentage of the people anywhere who make the necessary investigation to enable them to find for themselves the bottom truth of any theory. As a rule they accept by *faith*—because of their supposed superior wisdom—the opinions of noted persons, such as an esteemed President A, or a famous Professor B, or a noted Judge C, etc., as being the truth beyond all cavil. Of this class of persons there are no small number whose mental faculties are perfectly innocent of ever having harbored an original idea; and many of these latter are quick to stigmatize as cranks, and the like, all of those persons whose original ideas differ from their borrowed ones. For this class of persons, the mere statement of propositions which do not accord with their bigoted views is as efficient as a volume would be if that were filled with positive physical facts which would prove the truth of such statements, for they would alike reject either.

I propose, however, to make my statements sufficiently broad and explicit, so that they will arrest the attention of all who are possessed with inquiring and investigating faculties.

And, notwithstanding the fact that it is much easier to float with the wind and tide than to stem a deluging current, and more pleasant and popular to accept than contend against public sentiment, I shall, nevertheless, venture to make herein some statements which are in conflict with the prevailing belief. But I make them with the firm conviction that they point out the true cause—beyond all reasonable doubt—which produces the Tides, and the reasons for suspecting that it is this tidal influence that produces Earthquakes.

# EARTHQUAKES.

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## ARE EARTHQUAKES CAUSED BY THE SAME FORCE AS THAT WHICH PRODUCES THE TIDES IN THE OCEAN?

In this article I propose to discuss some points which lead me to suspect that they are. But what is the power that produces the tides? That is the leading question. The general belief of scientists is, that it is the direct attraction of the sun and moon which causes the waters of the earth, when they are nearest to these bodies, to fall towards them faster than its solid matter; and when the solid matter is nearest it causes that to fall towards them the faster, which leaves the water in both cases swelling into tides as it is being pulled away by the attraction from the earth on one side and left behind it on its opposite side. But this theory, which generally has the approval of scientists, does not accord with my views; which places me in this respect somewhat like the single juryman who had eleven stubborn adversaries to contend with; only the numbers who oppose my views are vastly more numerous.

My theory is, that the tides are actually caused by the effect on the waters of the oceans of the *changing movements* of the side or parts of the earth which *must* be the *inevitable result* of its revolution on its axis while moving in its *ORBITS*. These changes, though they are not wholly so in their effect, are something like the changing movements of the different parts of a carriage wheel when it rolls along the track: its very top moves faster in the direction in which it is rolling than its bottom. But I do not propose in this article to enter into an elaborate argument to prove any of

my propositions. That I reserve for a more extended work. In this brief article it would not only require too much space, but it would be useless if voluminously explained. I would as soon think myself able to convert any number of Mohamedans to Christianity, or to see Christians converted to Musslemen by the latters' argument, as that I could in any case, by the use of the best logic at my command, be that ever so cogent, change to my belief the views of any small number of those scientists who have been educated from youth to believe differently. From what I have learned, from history and my own experience and observation, I have come to the conclusion that it is largely not only a waste of time, but sometimes very much worse in its results, to contend with those who have inherited, or who have been taught from their youth, false ideas and doctrines; it is immaterial whether such relate either to science, politics, or religion. I shall, therefore, base my remarks in this article on what may be termed unproved statements. But these, however, I believe to be founded on positive physical facts.

Now, while it is not generally known, it is none the less a fact that in every revolution of the moon around the earth, which is accomplished—to put the time in round numbers—in twenty-eight days, that the earth, too, or its center, swings in the same time around the common center of gravity, between it and the moon, in a small orbit which is only about 5320 miles in diameter. In confirmation of this theory, that the earth swings with the moon around their common center of gravity, I notice with satisfaction the statement of such high authorities as Prof. R. A. Proctor, who incidentally in his article on astronomy in Encyclopædia Britannica, by computing on a different, and perhaps more correct basis than mine, puts the diameter of this orbit, at about 6,000 miles. Authorities differ somewhat in regard to the mean distance between the earth and moon, and also as to their relative difference in heft, which is a discrepancy that would show this orbit to be larger or smaller, depending upon which system its computation is based. But this difference, though it has its influence, is not of paramount

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importance. It is a fact that the earth moves around some center of gravity between it and the moon; that is the essential point. This center of gravity, when the earth and moon are at their average distance from each other—because the earth is 88 times the heavier body, as is claimed by some authorities—is 1290 miles below the earth's surface and 2660 miles from its center on the direct line from that to the center of the moon.

The revolution of the earth in this orbit causes a change in the movement of its sides in this *orbital direction*, as they are successively turned by its diurnal revolution from the position where they are furthest from the moon to that where they are nearest to it. This change, which is accomplished—to put the time in round numbers—in about twelve hours and twenty-seven minutes, causes a change in the movements of these sides of the earth, which may be sometimes as little as 39 miles, while at other times it may be as much as 53 miles an hour. That is, aside from all of its other regular movements, this revolution alone causes those parts of the earth which are at any time furthest away from the moon to be *moving* in this orbital direction somewhere between 39 and 53 miles an hour faster than those *same* parts will be moving when twelve hours and twenty-seven minutes later they are turned to the position where they are nearest the moon. (Some one may ask what causes this difference—39 to 53 miles an hour—in these movements? This is one of the statements which requires too much space within the limits of this work to properly explain. But it will be fully explained in another work, to which your attention is called further on.)

But such must be the inevitable effect of this movement of the earth in this, what I have called, its *Lunar Orbit*.

Now, in regard to the influence of the earth's motion in its annual orbit, it would be a waste of time and space to tell the intelligent reader that with the exception of the whirling motion of the earth's surface, the *effect* of which of *itself alone* never changes, because of its *diurnal revolution*, that he is being carried at midnight much faster—and if he is at

the equator from 5 to 6 miles an hour faster—in the direction which the earth is moving in this orbit than he is being carried at noon.

It is perfectly obvious that these changing movements, which occur so frequently, must affect the waters differently from their effect on the solid materials of the earth, for the reason that the latter, because of its adhesive quality, must move precisely with these changes. On the other hand, the water, because of its inertia coupled with its fluidity, must lag behind—where it is gathered in enormous quantities—when this movement is either increasing or decreasing, which leaves it in both cases swelling with tides on those sides of the earth which are in *front* and *behind* as it moves in these orbits. This latter effect, though not so obvious, is because it is at such sides of the earth where these movements are either increasing or decreasing the most rapidly. And this fact is also the reason why the tides as a rule are not high on the shores of the ocean on the meridian which is directly under the moon, nor on the opposite side of the earth from it, but they actually reach their climax several hours later.

I have assumed that the influence of these changing movements of these sides of the earth, which are produced by its revolution in these orbits and on its axis, may be more easily comprehended by the average reader by contrasting the effect which they probably produce on the water with that which they must produce on the land; that is, their effect on the actual existing conditions. But it would seem that there can hardly be a doubt, that if the globe were wholly water the impulse of these changing movements on such globe would swell its waters to a much higher level, and would force such globe into a much greater prolate spheroidal shape (lemon shape) than the waters of the earth assume under its present condition. And the diameters of such spheroid would change in length as the force of these changing movements differ; its longest diameter being always on the line which lies in the direction in which the center of this globe moves in its Lunar Orbit. That is, the

swelling of the tides by this influence would be the greater where this line meets the surface, which would be at those sides of the globe which are about 6 hours and 13½ minutes before and after the moon passes any given meridian. That must be the result, because the waters in this case being totally unimpeded by friction with solid matter, could only be restrained in these movements by gravitation. And the inertia of a whole hemisphere of this globe of water, when it is being turned from its faster motion when it is on the opposite side of this globe from the moon, would cause it to swell in this orbital direction into a protuberance beyond the curve of a regular sphere, before such faster motion could be reduced by gravitation to the average of this whole globe, or to that of its center. And the inertia of its whole hemisphere, which is nearest to the moon when it is being turned from its slower motion, would cause that to lag equally as far behind such regular curve before its slower movement could be increased by gravitation to correspond with the movement of the center of this globe. And the long diameter of the spheroid, thus formed, would change in length as the varying force of these changing movements differ. It appears to me certain, that such would be the effect of these changing movements on this globe if it were composed wholly of water.

Since that would probably be the effect in such case, then this important question arises: What must it be on the central parts of the earth if that is a fluid mass of melted matter? This becomes especially important, since this fluid melted condition of its center is in the highest degree probable; for it is found when boring or mining down from the surface everywhere, that there is a nearly uniform increase of temperature met with, which, if continued, would melt all known substances below a depth of from fifty to one hundred miles.

Then, as the specific gravity of the whole earth is known to be from five to six times heavier than water, this central fluid must be that much heavier than its equal bulk of water, and more than twice that of granite. And,

because of its fluidity, it would be influenced by the same laws of motion as if it were water. But its vibrations, if unrestrained, would be much more extensive and of greater force because of its superior heft.

Then, when we consider in connection with these possibilities this other point, that this heavy fluid is inclosed within a thin shell of semi and wholly solid matter, which together is not much thicker when compared with the whole diameter of the earth than the shell of an egg is to the egg, the effects of these changing movements on this heavy central fluid must have the *tendency*—let me repeat, must *have the tendency*—to force that also into a spheroidal shape whose diameters would be *inclined* to vary in length as the intensity of the effect of these varying changing movements differ.

In this connection let us take into account this point also, which is the mathematical fact, that when there is any change whatever in the shape of any given quantity of matter there must be a change in its surface area; and that this area is the least that is possible, when such matter is in the form of a perfect sphere. Then, since the least change in the shape of this internal matter requires a change in the area of its inclosing shell, it becomes at least a possibility that it is the straining tendency on this thin shell of solid matter, which it receives from this pent up fluid, the geometrical figure of which is *inclined* to be continually changing from the varying force of these changing movements, which is one of the causes, and perhaps the principal one, which produces earthquakes.

It may not necessarily follow, that if that be their cause they would always take place either at or near the time of full or new moon, when the bursting tendency of this pent up matter would be the greater because of its tendency then to require the greatest increase in the area of its covering; nor, at the time of the moon's quarters, when this tendency would require the greatest shrinkage of this area, which would cause this crust or shell of the earth to sink, collapse, or contract. But, although they would be more

likely to take place at or near those dates, yet, like the repeated stroke of a hammer on a rock, it is often the case that it is one of the lighter strokes which produces the final break. So the repetition of the straining tendency of this internal fluid on the crust of the earth may cause that at its weaker parts to tremble, collapse, or burst at a time between these extreme pulsations, when this tendency is such as to produce neither its greatest or least force.

Under ordinary circumstances, it may even be suspected that this crust of the earth may be sufficiently flexible and elastic so that it, too, may swell and shrink sufficiently to counteract the effects of the tidal influence of these changing movements on its central parts, so that they may produce in most cases no perceptible trembling or jar at the surface.

These speculative views become to a large degree certainties if the central part of the earth is in fact a seething, fiery fluid. Just think, for a moment, of the enormous power which must be required to control the surging movements of this immense mass of matter, whose speed is certainly changed to the extent of many miles an hour, in every period of a little over twelve hours. It is really no wonder, when we think of it, that large areas of the earth's crust have been upheaved and torn assunder, and other large areas have sank or subsided from the effects of the successive strainings which it has received from this enormous heft of matter, some of which, by this tidal influence, moves against this crust of the earth at a speed of from thirty to fifty miles an hour.

W. P. MORE.



I wish to call the attention of all those who may secure a copy of the foregoing article on earthquakes, to a volume entitled as below, the manuscript for which, with the exception of a few minor revisions, has been complete for many months:

THE WEATHER.  
GEOMETRICAL NOTES.  
THE TRUE CAUSE OF THE TIDES,  
AND  
SOME SPECULATIONS IN REGARD TO  
EARTHQUAKES,  
AND  
THE RELATION OF THE METEORIC MATTER IN SPACE  
TO COMETS  
AND THE FIXED STARS.

The most fastidious reader must surely find at least some one of these subjects interesting.

Among its leading features will be found a *full* explanation of how the inevitable changing movements of the different parts of the earth, which are caused by its revolution in its orbits and on its axis, must produce the tides and all of their various changes and peculiarities.

Its meteorological part, however, will be much the most interesting. And, as that will contain some startling views in regard to some meteorological conditions, which are certainly correct, and others which may possibly be so, I will caution the reader that it is well not to pass judgment in advance, but to wait until you examine all of the evidence which will be brought to bear on these views before rendering your decision. In this article some rules are given, and the reasons for them, which will enable a judicious observer to make a close *guess* as to what the prominent weather conditions will be for a coming week. And some reasons—which will appear startling—are advanced for suspecting that the very top of the air starts towards the poles from the

torrid parts of the earth at the rate of many *thousands* of miles per hour; with the final result that there may be small zones immediately surrounding the poles where the climate may be excessively tropical. It will explain the causes for the rapid changes of temperature, and of the winds, which are noted features of the weather. And, also, the cause (a new theory) for the rising and falling of the mercury in the barometer; and how the intense cold may be produced which freezes into hail the raindrops while they are falling through it. And this article will contain many equally interesting meteorological matters which are too numerous to mention in this brief space.

The mathematician will be interested in the demonstration of the few propositions and problems—all of which are believed to be new—which will be found in the Geometrical Notes; one of the simplest of which is the fact that the sum of the areas of the two crescents, which are formed by half circles when they are drawn on the sides of any right-angle triangle, taking its sides for the diameters of such half circles, is equal to the area of the triangle.

For a numerous class of readers, not the least interesting matter in this book will be The Speculations in Regard to the Relation of the Meteoric Matter in Space to Comets and the Fixed Stars.

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The most of this work has been ready for publication—except the necessity for some slight revision—for several months. But the paramount difficulty so far in getting it out, has been my nearly absolute empty purse; this, when combined with my poor business ability, form a mountain too large for me to overcome, when it is considered that the cost of its publication in a limited edition—say of 500 copies—together with the cost of advertising to get it in demand, which would appoximate the price anticipated for the book.

But some one says, why not apply to some reliable publishing house and have them get it out for you on the royalty plan? That I have attempted to accomplish also, and have learned—or perhaps only *suspect*—that it is not only extreme-

ly difficult to get people to appreciate new ideas, even if they are sound, when they conflict with old established theories; but I *suspect* that just the title of this work, because a part of it (The True Cause of the Tides) intimates so strongly that it conflicts with the theory of Newton, in which people have the utmost *faith*, that publishers even, who can know nothing of the contents of the work, beyond what its title suggests when their attention is called to that *alone*, reject the whole as if it were a species of heresy.

While the price of this book or pamphlet, which treats on the probability that earthquakes are caused by tidal influences, will be ten cents, I shall give it, however, a wide distribution *gratis*, and hope that no one to whom it may be sent will take it as an imposition by its being thus thrust upon them. I shall "not kick," however, as the slang phrase goes, if I should receive ten cents or more by mail from any of these parties. And on the receipt of twenty cents from any one of them I will enclose by mail to his or her address, prepaid, a part of the forthcoming book which will be entitled: "Some Speculations in Regard to the Meteoric Matter in Space, and its Relation to Comets and the Fixed Stars."

If any one into whose hands this book falls should have the *curiosity* to know what the balance of this other work, which is only in embryo, will contain, I would be pleased to have his or her address—not as subscribers—but the number of such names will be a guide from which I may determine whether it will pay to procure its publication.

The complete work will cost, per volume, when *substantially* but not *gorgeously* bound, not to exceed \$1.50 (and not much less than that).

N. B.—Send me no communication that requires a response, as I am too poor to furnish stamps and paper, and my time is too fully occupied to allow me to answer many questions.

W. P. MORE.

KINGSTON, ULSTER COUNTY, N. Y.